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ARMY TECHNICAL INTELLIGENCE REVIEW

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Cover picture: A Polish T-54A Schnorkelling with a GSP Ferry in the background.

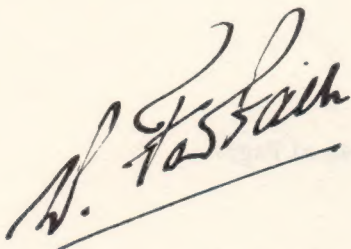
ARMY TECHNICAL INTELLIGENCE REVIEW No 103 (RESTRICTED)

FOREWORD

The growing importance of China in the Technical Intelligence field is underlined by the article on Chinese AFVs. Interesting variations of known equipments are covered in several of the other articles and there are also interesting reviews of small arms and mine warfare equipment from Czechoslovakia and the Soviet Union.

I am now firmly in the chair and no longer the new boy in the Branch as we have recently had a further staff change. Major David Dudley is now presiding over the mysteries of the Radar desk having taken over from Major David James.

Finally, I must record that by the time this issue is out, Mrs Wood who has steered so many of our publications into print, will have left the Branch on retirement.



W A H FAIRBAIRN
Colonel
Tech Int (A)

Corrigendum

ATIR No 102

Page 3 sub para d amend 'right' to read 'left'.

1. CHINESE AFVs

Introduction

In the last two decades the Communist Chinese have developed a considerable AFV industry. They are now producing AFVs not only for their own home market but for export. So far their AFVs have been supplied to countries as far apart as Albania, Tanzania, Pakistan, North Vietnam and North Korea.

Although the first tank the Chinese produced was a direct copy of a Soviet one their subsequent AFVs have all been of indigenous general design.

Medium Tank Type 59

The Type 59 medium tank was the first tank produced by the Communist Chinese. It is a direct Chinese copy of the Soviet T-54A and is virtually indistinguishable from it and has the same major characteristics:

- a. Crew 4
- b. Weight 36 tonnes
- c. Main armament 100 mm rifled gun (34 rounds carried)
- d. Secondary armament 7.62 mm co-axial MG
7.62 mm hull MG
12.7 mm externally mounted MG
- e. Engine 520 HP diesel (the same pattern engine as the T-54 series tanks)
- f. Road speed 50 km/hr
- g. Road range 500 km
- h. Schnorkelling. No provision.
- j. NBC protection. Nil.

This tank is known to have been exported to Albania, Pakistan and North Vietnam.

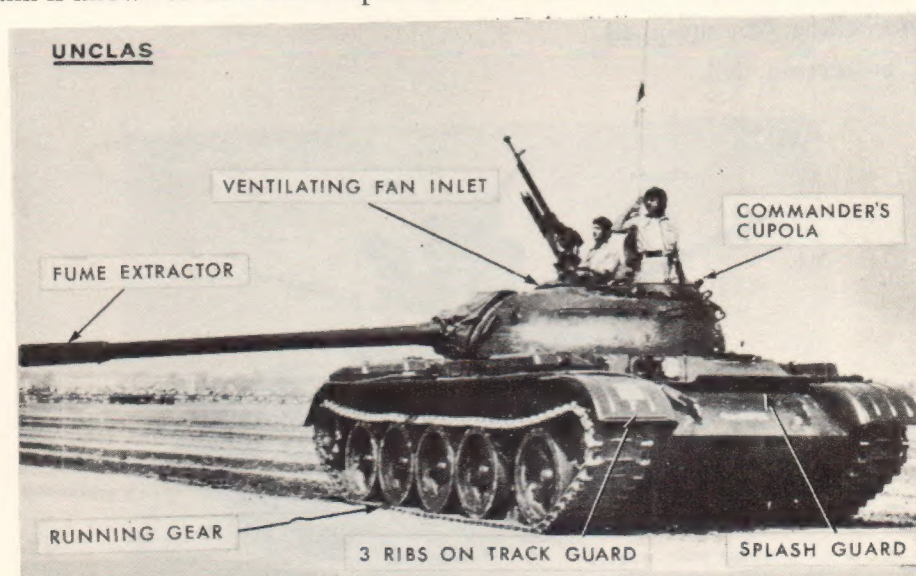


Fig 1 Type 59 Medium Tank Pride in Pakistan



Fig 2 Type 59 Medium Tank Vanquished in Vietnam

Light Tank Type 62

After the Type 59 the Type 62 light tank was probably the next tank manufactured by the Communist Chinese. It was seen on parade in Tanzania on 1 September 1969, when the photograph in Fig 3 below was taken. Since then it has also appeared in service with the Albanian and North Korean (Fig 4) armies. The Type 62 appears to be a scaled down version of the Type 59 and reflects its big brother even down to the ventilator dome in front of the loader's hatch. Very little detail is known about this tank but its major characteristics are thought to be:

- a. Crew 4
- b. Weight about 20 tonnes
- c. Main armament 85 mm
- d. Secondary armament 7.62 mm co-axial MG
12.7 mm external MG
- e. Road speed 50 km/hr
- f. Schnorkelling. Not equipped.
- g. NBC protection. Nil.



Fig 3 Type 62 Light Tanks on Parade in Tanzania



Fig 4 Type 62 Light Tanks on Parade in Pyongyang, 4 June 1972

The main points which distinguish the Type 62 light tank from the Type 59 medium tank are:

Type 62 Light Tank

a. Loader's Hatch

Housing vertical with no securing bolts.

b. Fume Extractor

The forward end appears to be tapered and is set back further from the muzzle than that of the Type 59.

c. Track Guard

There are four ribs on the front of the track guards.

d. Tracks and Roadwheels

The track is narrow and has double horns which pass either side of the single roadwheels.

Type 59 Medium Tank

a. Loader's Hatch

Housing chamfered with sockets and securing bolts.

b. Fume Extractor

The forward end has a more pronounced almost vertical step and is closer to the muzzle.

c. Track Guard

There are three ribs on the front of the track guards.

d. Tracks and Roadwheels

The track is broad and has only a single horn which passes between double roadwheels.

The Type 62 has been produced with two sorts of roadwheels. The Tanzanian tanks in Fig 3 have the older pattern which are stamped and resemble the roadwheels of the Soviet PT-76 amphibious tank. The tanks in Pyongyang (Fig 4) have a newer pattern which are forged and resemble the Type 59 roadwheels.

Amphibious Tank Type 60/63

The Type 60/63 is thought to be the latest tank the Communist Chinese have produced. So far it has only been seen in service with the North Vietnamese Army. The hull of the tank is the normal large hull of an amphibian with panniers over the tracks and resembles the hull of the Soviet PT-76 amphibious tank. The running gear is almost identical with that of the PT-76 but the resemblance, below the turret, stops here. Inside the rear of the hull instead of the 6 cylinder in-line diesel engine developing 240 hp of the PT-76 is the same V12 cylinder diesel engine of the Type 59 which develops 520 hp. This gives the Type 60/63 a power to weight ratio of the order of 28-30 hp/tonne. This is quite remarkable when it is compared with that of SCORPION which is 27.3 hp/tonne.

The turret of the Type 60/63 is similar to that of the Type 62 and mounts an 85 mm rifled gun which is thought to be the same as that mounted in the Type 62 tank turret. The turret is of light construction and although to the casual observer its dome shape would give the impression of its being cast it is in fact made up of a series of welded plates. The weld line can be seen quite clearly in Fig. 7.

The main characteristics of the Type 60/63 are:

- | | |
|---------------------------|---|
| a. Crew 4 | |
| b. Weight (Estimated) | 21 tonnes |
| c. Main armament | 85 mm rifled gun (45 rounds carried) |
| d. Secondary Armament | 7.62 mm co-axial MG |
| | 12.7 mm externally mounted MG |
| e. Engine | 520 HP diesel (same pattern as the Type 59) |
| f. Road speed (Estimated) | 60 km/hr |
| g. Road range (Estimated) | 500 km |
| h. Amphibious | Swims with water jet propulsion |
| j. NBC Protection. | Nil. |

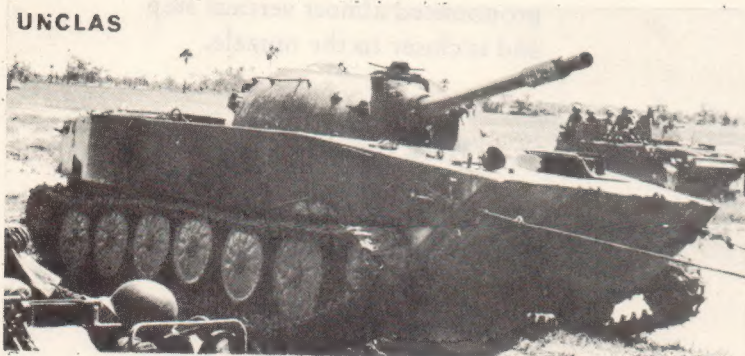
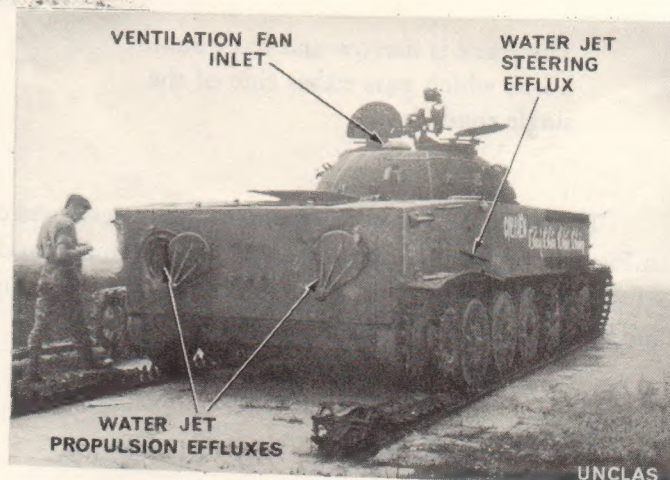


Fig 5 Type 60/63
Front View

Fig 6 Type 60/63
Rear View



APC M 1967

The APC M 1967 was seen on a parade in Tirana, Albania in November 1969. Since then several of these vehicles have been captured from the North Vietnamese. In its general layout this APC resembles Western APC thought rather than the original Soviet concept, in that the infantry section mount and dismount through a large rear door. In addition to this door they have a roof hatch on either side of the vehicle but no vision devices for closed down observation. There is, however, a small port on either side of the vehicle which can be used for observation or firing. Fig 7 shows this port open with the plug hanging on its wire retainer. The armament is a Type 54 12.7 mm MG (a copy of the Soviet DShK). It is mounted on a traversing ring with an elevating gear and located in the centre of the vehicle and directly behind the engine. This MG can be used in the ground or AA role. The driver and radio operator sit on the left and right of the front compartment respectively which they share with the transmission. The commander sits directly behind the driver and to the left of the engine.

The APC weighs between 12 and 10 tonnes and is an amphibian propelled by its tracks which are shrouded to aid its performance in water. The shrouding is missing in Fig 10 and is damaged in the other three Figs. A wading board is fitted at the junction of the glacis and nose plate as is usual on amphibians. A novel feature is the boat hook marked in metre lengths which can be seen on the upper right hand side of the vehicle in Fig 11. The engine is a 6 cylinder in-line diesel which is very similar to the engine of the PT-76. The tracks and roadwheels are also similar to those of the PT-76. The vehicle has a crew of 4 and can carry an infantry section of from 10-12.



Fig 7 APC M 1967 Front View



RESTD

Fig 8 APC M 1967 Rear View Showing Door



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Fig 9 APC M 1967 Rear View Door Open

2. WARSAW PACT AFVs

AAMGs on Tanks

The 12.7 mm DShK MG which was externally mounted on the loader's hatch of the T-54 but was later discontinued on the T-55 appears to be coming back into favour. Its most notable reappearance is on the T-62 as this has resulted in a completely new mould for the turret casting as the area round the loader's hatch has been built out and levelled to take the rotating ring of the MG. Figs 1 and 2 shows the difference in the area of the loader's hatch between the original T-62 and the variant with the externally mounted MG which is called the T-62A.



**Fig 1. T-62
Rear View**



**Fig 2. T-62A
Rear View**

The Poles have also been fitting the 12.7 mm MG to their T-55 series tanks and Fig 3 shows a T-55A with one fitted. The T-55A differs from the standard T-55 by having thickened crew hatches and the base of the commander's cupola built out. The fitting of the external MG mounting on the T-55 has not involved any dramatic change in the turret casting as the base for the rotating ring is bolted direct onto the turret as on the T-54.



Fig 3 Polish T-55A with 12.7 mm AAMG

(NB: The tank can be clearly seen to be a T-55 series vehicle as there is no ventilator dome in front of the loader's hatch)

Non-Soviet Warsaw Pact APCs

The Czech-Polish 8 wheeled OT-64 series now has several turreted variants. Both the Czechoslovakian and Polish Armies use the OT-64C(1) shown in Fig 4. This has its armament, a 14.5 mm HMG and a co-axial 7.62 mm MG, in a turret very similar to that of the Soviet BTR-60PB. On the OT-64C(1) the turret is on a pedestal to give it height and so to reduce the obstruction of the gunners field of view in depression by the long roof plate of the vehicle. A further variant of the OT-64C(1) was seen on the Warsaw Pact exercise "SHIELD '72" which has vision blocks in the turret pedestal. (Fig 5). The Poles have yet another variant in the OT-64C(2) which is shown in Fig 6. The turret on this variant allows the gun greater elevation, presumably with the intention of giving it an AA capability. The OT-64C(2) also has another feature which it does not share with the OT-64C(1) in that it has a cowl just to the left rear of the turret pedestal. This fitting is presumed to be an air intake to ventilate the infantry section compartment in the rear of the vehicle.

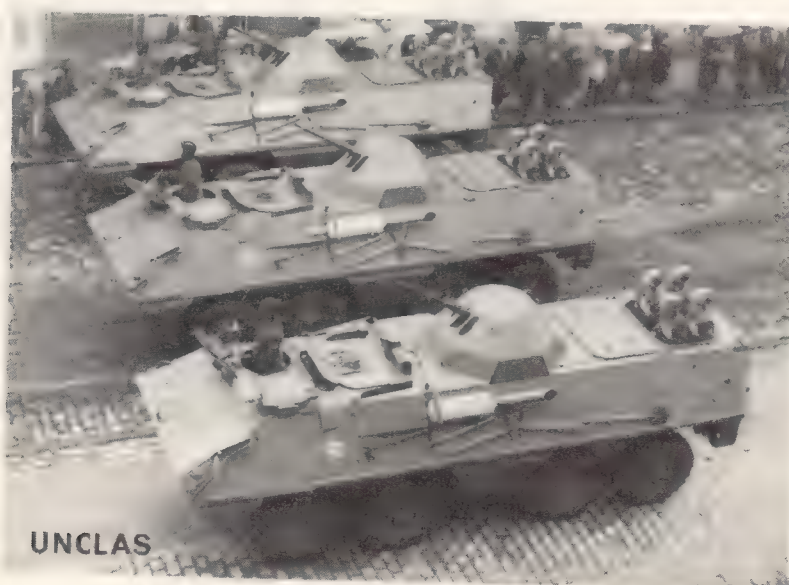


Fig 4 OT-64C(1)

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Fig 5 OT-64C(1) with
Vision Blocks in the
Turret Pedestal

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Ventilator



Fig 6 OT-64C(2)

The Hungarian Peoples Army uses the indigenously produced FUG M 1970 as its APC. This vehicle is somewhat smaller than the normal Warsaw Pact APC but despite this it is still an amphibian and can carry as many as 9. Although its turret differs from that of the Soviet BTR-60PB and the Czech-Polish OT-64C(1) and (2) it carries the same armament.

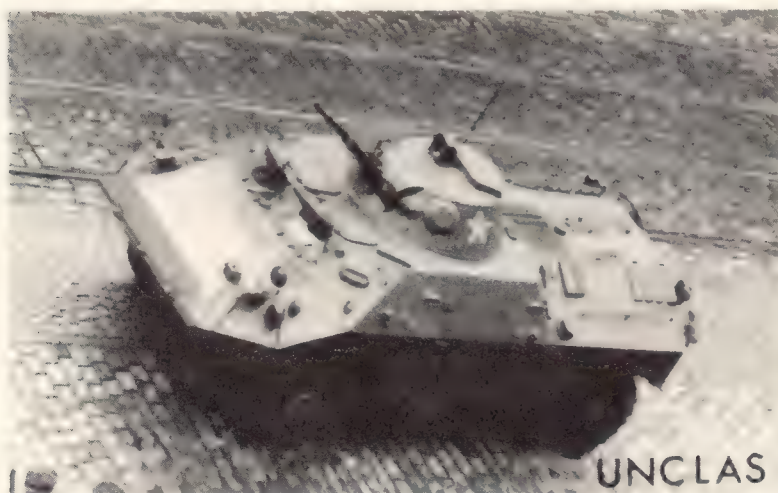


Fig 7 FUG M 1970

Comment. This must be a nightmarish vehicle for the section when it is swimming. The only men with ready exits are the driver and co-driver. There is no hatch in the turret and it would be impossible to open the side doors until the water level inside the vehicle had reached their top edge.

3. NEW BM-21 ROCKET LAUNCHER ON TATRA 813

This new rocket launcher was first seen on the final parade of Ex SHIELD 72 in Prague on 16 Sep 72. It appears to be a new model of the Soviet 122 mm (40 Rd) Rocket Launcher BM-21 mounted on a Czech Tatra 813 (Fig 1). The rocket launcher assembly appears to be the same as the Soviet BM-21 covered in ATIR 100 dated Oct 71, but the modified Tatra 813 with an armoured cab and the spare salvo of 40 rockets are very interesting. We wonder if the rockets can be loaded automatically as a salvo which would be faster than by hand and whether the spare salvo is palletised which would be very attractive.



Fig 1 BM-21 mounted on Czech TATRA 813

It is possible that the armoured cab has been put on to protect the crew or because there is some danger from the spare salvo when firing as can be seen in Fig 2 but this we do not know.



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Fig 2 Firing BM-21 Rockets

It is an interesting development as it opens up the possibility of automatic loading which might reduce the time between salvos from the present 10-15 minutes to something less than 5 minutes. This of course would increase the threat from the weight of fire in a given time from BM-21.

4. NEW SOVIET TRACKED PRIME MOVER

Army Technical Intelligence Review No 100 issued in October 1971 gave details on pages 17 to 24 inclusive, of the then current range of Soviet Tracked Prime Movers.

During the last quarter of 1972 we saw an addition to this range, initially, in October, with the Group of Soviet Forces Germany and later on the November Parade in Moscow.



Fig 1 New Soviet Tracked Prime Mover. Based on ATS-59



Fig 2 Tracked Artillery Tractor, Medium ATS-59

As will be seen from a comparison of the new vehicle (Fig 1) with ATS-59 (Fig 2 — and page 20 of Army Technical Intelligence Review No 100) this latest Soviet Tracked Prime

Mover seems to be identical to ATS-59 except for the cab. The new vehicle cab design is, however, far more box-like, with the engine apparently placed behind the cab and the windscreen in three sections rather than two.

We would assume the cab to have increased crew capacity as well as vastly improved forward vision, the design typifying the more advanced recent Soviet thinking on human engineering standards. We would also expect the new vehicle to have a more powerful engine than the 300 hp V12 diesel of ATS-59.

Estimated Technical Characteristics

Payload, Cargo	3000 kg
Payload, Personnel	2(3?)+14
Towed load	14000 kg+
Maximum Speed	50 Kph (?)
Crusing Range	450 Km (?)
Length	6300 mm
Width	2800 mm
Overall Weight	13000 kg+
Engine	400 hp(?) 4 stroke V12 Diesel

5. CZECHOSLOVAKIAN SMALL ARMS SYSTEM

As a country of the Warsaw Pact, Czechoslovakia is somewhat unique in that it produces its own small arms, ostensibly to its own designs which bear only a vague resemblance to their Soviet equivalents. The latest effort in the small arms field is the system URZ or Universal Small Arms System.

The system appears to have been designed for the 7.62 mm NATO projectile and so it is obviously aimed at the export market, although there may be a version which is built to chamber the Czechoslovakian 7.62 x 54R mm round, as in the M-59 Machine Gun series. Four weapons comprise the system. They are the Automatic Rifle (AP), Light Machine Gun (LK), Heavy Machine Gun (TK) and Tank Machine Gun (T). All are gas operated.

The first three (AP, LK and TK) have certain features in common. Their sighting systems, both mechanical and optical, are the same. They are fitted with adjustable foresights and leaf-type rear sights. There are 9 different range settings but the graduations are not known. The optical sight can be fitted to all three models, however, it is normally found on the TK model. It includes the facility to detect and fire at active infra-red sources. Fitted about the foresight is a collapsible grenade sight.

The feed system is based on a 50 round drum magazine made of a light alloy, feeding vertically from under the receiver. An external belt can be used with the drum magazine in place. It would follow that the ejection opening is on the right hand side of the receiver, in keeping with Western design. This is a change from the method used in the M 59 series Machine Guns. A small magazine, probably box-type, is provided to feed the ballistite-type cartridges used to launch grenades or if required, for other natures of ammunition.

All three weapons are capable of semi-automatic or automatic fire, and each has a rubber pad fitted over the butt to reduce recoil shock, particularly when firing grenades.

AUTOMATIC RIFE (AP)

The Automatic Rifle (AP) (Fig 1), is intended to replace existing SMGs and Assault Rifles. It weighs 3.9 kg (unloaded) and is 99.5 cm long (less bayonet). The barrel is lighter than those of the other three weapons, and it is not lined. Its bayonet is 'multi-purpose', probably incorporating a wire cutting capability similar to that of the Soviet AKM bayonet.



Fig 1 Automatic Rifle (AP)

LIGHT MACHINE GUN (LK)

The major differences between the Light Machine Gun (LK) (Fig 2) and the AP (Fig 1) are a heavier barrel and a folding bipod. The barrel is lined (probably chrome) to give it longer life. The LK is the same length as the AP but weighs 5.2 kg (unloaded).



Fig 2 Light Machine Gun (LK)

HEAVY MACHINE GUN (TK)

Basically, the Heavy Machine Gun (TK) (Fig 3) consists of the LK mounted on a tripod. The optical sight is normally fitted and the weapon is usually fed by a 250 round external belt. If required, the tripod can be converted into a bipod to permit use of the weapon in an anti-aircraft role. The gun with mount weighs 11 kg and the system is 1.2 m long.



Fig 3 Heavy Machine Gun (TK)

TANK MACHINE GUN (T)

The Tank Machine Gun (T) (Fig 4) is intended for mounting on AFVs and in aircraft. It has a firing solenoid for remote operation and is belt fed. It weighs 5.7 kg, is 87.7 cm long and has a theoretical rate of fire of 1100 rounds per minute.

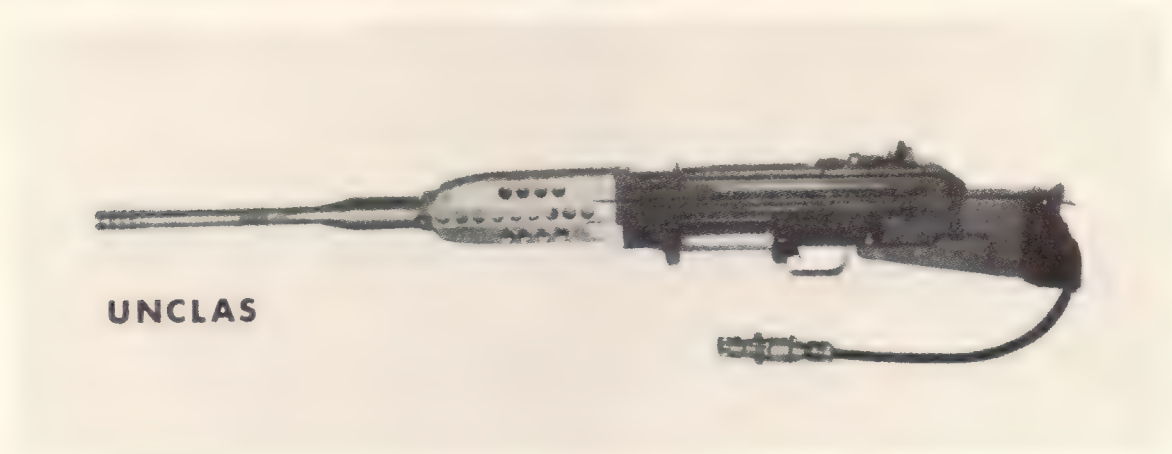


Fig 4 Tank Machine Gun (T)

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6. SOVIET MINE WARFARE EQUIPMENT (UNCLASSIFIED)

The following is an extract from the Russian publication "Engineer Support in Combined Arms Battle" which gives a brief review of Soviet equipment used in the laying, reconnaissance and neutralisation of minefields.

Machines and mechanisms for laying, reconnoitring and negotiating minefields include the PMR-2, and PMR-3 towed mine layers, the vehicle-mounted wide track mine detector DIM, the roller type mine clearing attachments PT-54 and PT-55, plough type mine clearing attachment KMT-4 and the KMT-5 (Fig 1) which is a combined type (roller and plough).

The PMR-2 towed mine layer carries out the mechanised laying of anti-tank mines, either scattered or sown in the earth at intervals of 4 or 4.5 metres. When laying mines the layer may be towed by an APC or ZIL-157 at a speed of 4-10 km/hr. The number of mines carried depends on the capacity of the towing vehicle. The BTR-60P takes 100-130 anti-tank mines while a ZIL-157 holds 200.

200 mines can be laid in 15-20 minutes by a detail of 4 men. A section can load the carrier vehicle in 10-15 minutes. On the average, one to two loads of mines can be laid per hour provided the mine dump is not more than 5 km away from the minefield.

The wide track mine detector DIM is mounted on the GAZ-69 vehicle. If a metallic mine is present in the vehicle's path, the device automatically stops the vehicle which may travel at a speed of up to 10 km/hr. The width of the detector frame is 2.2 metres and it can detect mines of the TM-46 type at depths of at least 25 cm. This induction type detector thus gives quick reconnaissance of roads and tracks.

The mine clearing roller attachments PT-54 and PT-55 (fitted respectively to T-54 and T-55 tanks) are designed to clear a minefield by successive sweeps. Plough type KMT-4 attachments are used to negotiate minefields which have been previously located. Dependent on the type of ground, the operating speed is 6-12 km/hr. The road speed for travelling is 18-24 km/hr. The PT-55 attachment weighs 6.7 tonnes which is 2 tonnes heavier than the PT-54, and has 4 rollers per section (the PT-54 having 5). It takes 15-20 minutes to fit the attachments to tanks and a few minutes to detach them afterwards. The PT-55 clears tracks 0.83 metres wide (0.37 metres narrower than those of the PT-54) and an 'unswept' area between the rollers of 1.73 metres (0.43 metres more than that of PT-54). Roller sections can withstand up to 10 detonations of mines containing 5-6 kg of TNT each. The path of the rollers is marked by furrows on the inside edges of the paths cleared. A special chain is stretched between the roller sections to deal with belly-attack tilt-rod mines in the "unswept" zone.

Roller sections follow ground contours well and guarantee the detection and sweeping of minefields on solid surfaces. In the case of snow more than 20 cm deep, loose sand or ploughed and other loose soil, the rollers stop turning and push up a bank of snow, sand or soil. Displaced mines are pushed along in this bank until pushed aside into the "unswept" area or to the outside of the tracks. In some cases such as in snow they may then slip under the track of the tank. Also such conditions grossly overload the engine, running gear and especially the steering clutches.

While mine-clearing is in progress, the arc of fire is restricted in the areas of about 11 o'clock and 1 o'clock, ie in those sectors where the gun barrel would be over the roller sections. Detonation of the mine causes a roller section to leap up sharply enough to cause possible damage to the barrel.

Nevertheless, roller type attachments remain the only means of reconnoitring and negotiating minefields during an attack without reducing the tempo of the latter. They have to be used with good sense, their good and bad points being borne in mind.

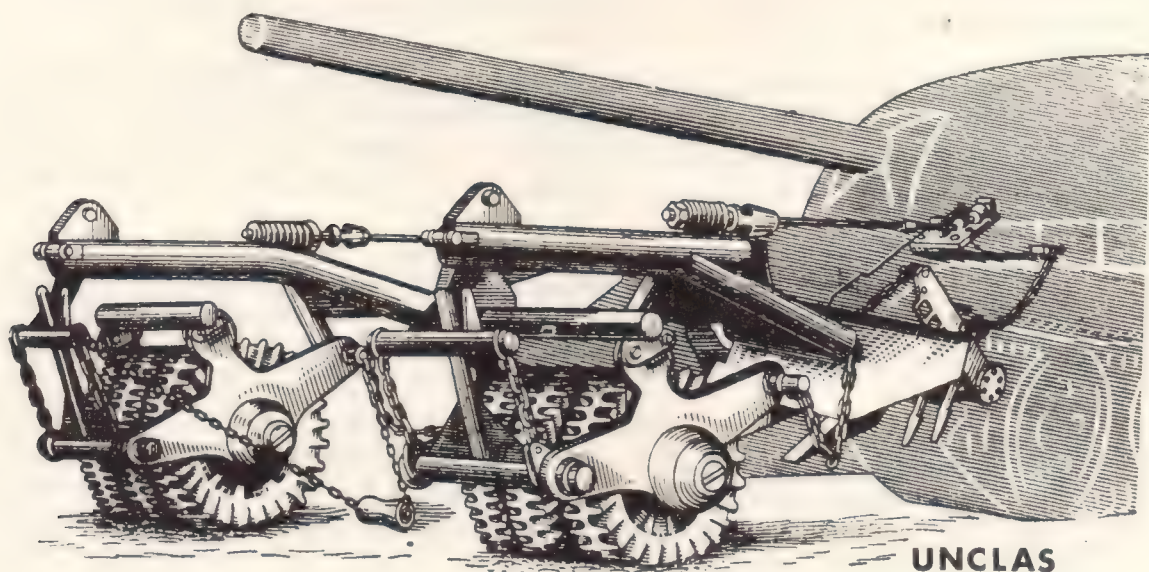


Fig 1 KMT-5 Roller Plough

7. FOREIGN ARMY EQUIPMENT QUIZ

A "bakers dozen" for you to solve.

You will really have to be good this time and no peeking at page 26 for the answers.

Remember — "You can fool all the people some of the time and some of the people all the time, but
YOU CAN'T FOOL YOURSELF!"



1. Brings to mind a Praying Mantis, but what is it?



2. What is odd about these OT-64C(1)s?



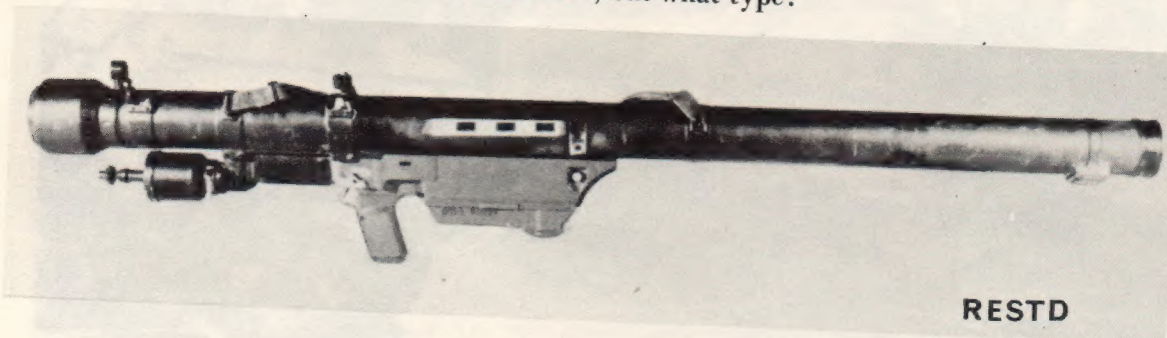
3. They are not laying pipes for North Sea Gas, but what are they laying?



4. Name both the Tank and the Bridge

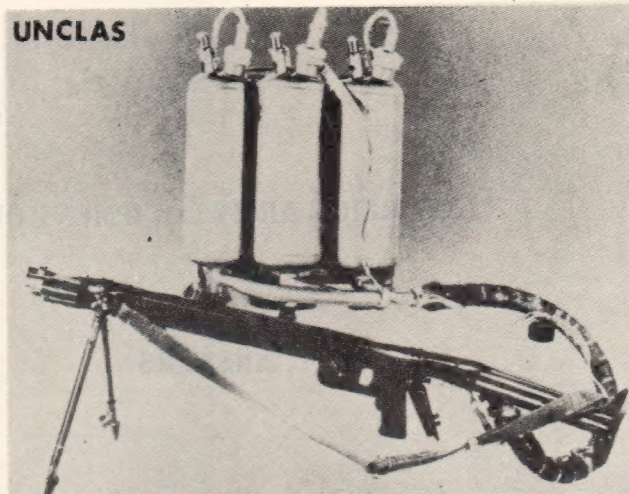


5. A Radio set, but what type?



6. Not really a musical instrument. What is it?

7. Aqua Lung and Harpoon Equipment?



8. Even with all the camouflage you should be able to tell the difference!



9. Looks like Steptoe's backyard! What types of equipment can you name?

FOREIGN ARMY EQUIPMENT QUIZ

ANSWERS

1. A Soviet 82 mm Recoilless Gun B-10
2. They are crewed by EGA Troops. The EGA do not have these vehicles. The vehicles were loaned to the troops taking part in the final parade of SHIELD 72 in Prague.
3. A Soviet 76 mm Recoilless Gun SPG-9.
4. A T-62 crossing a TMM.
5. Soviet R-126 Transmitter-Receiver.
6. SA-7 Man portable SAM launcher.
7. No. A Soviet Light portable Flamethrower LPO-50.
8. The forward tank is a Type 59 and the one in rear is a Type 62 (the clue is the width of track in relation to the track guards).
This picture shows these Chinese tanks in service with the Albanian Army.
9. (a) Soviet Man portable SAGGER ATGW and carrying box.
(b) Soviet 122 mm two stage Rocket and Launcher DB-1B
(c) Chinese 107 mm Rocket Launcher Type 63
(d) Another 122 mm two stage Rocket.
(e) SA-7 Man portable SAM.